Land Rehabilitation FAQ
Black Forest Fire

Trees and Forest Stewardship in a Burned Forest

Do I need to cut down all the trees on my property?

Depends, but generally no. There is no need to cut down all fire-damaged trees on your land, only the ones that pose a hazard to people, animals, personal property, utilities, and other structures that might be impacted from falling trees. Ultimately, it depends on your objectives. Ecologically, it is appropriate to leave dead burned trees standing on your land, as their presence is benign unless they pose a hazard by falling down. When cutting dead trees, you should try to limit soil disturbance and the number of vehicular trips across your land. This will help to minimize post-fire erosion and the potential for noxious weed introduction to the disturbed soil. Also, be sure to take note of the safety instructions included in the next paragraph.

Are fire-killed trees a falling hazard?

They certainly can be. After the fire, you should focus on removing severely burnt trees along roads, driveways, near your home site, and in areas where you spend a lot of time. Fire-killed or partially-burned trees are at high risk for falling unexpectedly, especially as the trees begin to decay in the years following the fire. Stay out of the forest when there are strong winds or if a precipitation event has made the soil very wet.

You are encouraged to not cut larger-sized burned trees on your own. Burned trees are significantly more dangerous to cut due to their compromised stability and potential for limbs higher up in the tree to fall unexpectedly. It is recommended that property owners and affected communities as a whole look to hire licensed, bonded and insured contractors who have extensive experience in safely cutting hazardous burned trees. In the years following the fire, many of the trees will begin to fall on their own as roots, trunks and limbs decay. Landowners should continue to be aware of these hazards.

How can I tell if my trees are dead or alive? What should I do about the burned trees on my land?

If the trees do not pose an immediate falling hazard, you can monitor the trees over the winter and into the spring to see which trees survive. Not all burned trees will die. Ponderosa pines, for example, are a fire-adapted species. If a tree has any green needles left on its branches, it may have a chance to survive, even with up to 75% crown scorch, but that number rapidly decreases in drought conditions. The tree can be monitored to see if needles re-sprout or if the tree grows new buds and branches in the spring. If a tree is a blackened stick with no needles remaining, the tree is assuredly dead and can be considered for removal if it poses a risk.

What can I do with burned trees I've have cut down?

We highly recommend that you not take all cut-tree material off-site; often trees are more valuable left on-site than when hauled away. Consider first if the tree can be salvaged for something useful on-site. One of the best uses for dead trees is to chip them and broadcast the chips back onto the burned land for erosion control (see page 3 for additional information about chip mulching treatment guidelines). Some trees can be left standing for use as wildlife snags (i.e., dead trees=homes for birds and other animals). Others

may be used as a cross slope erosion barrier to help stabilize soils in some situations (see page 6 for contour log felling treatment guidelines).

Do I need to replant trees and when do I need to replant?

To plant or not to replant? Either way, the best time to plant is in the early spring. The worst time is in the summer. Seedling trees come from a perfect greenhouse environment where their every need is met. Transporting those fragile seedlings to a patch of burned land and expecting them to take hold can be futile if extra care is not taken to acclimate them to their new home. Good planting techniques, such as establishing proper root zone contact (no large air pockets in the root zone) and keeping roots straight in the ground (roots extending fully downward), in addition to mulching, creating weed barriers, and providing frequent small volume watering will provide the very best chances for survival.

As you're replanting, keep in mind that lower elevation forests, known as the lower and upper montane life zones, were historically up to 30-50% treeless covered land. At best, they were a mosaic of largely discontinuous forest cover, meadows, large open grassy slopes (particularly south facing), and a mix of shrubs, forbs, and grasses and far fewer trees per acre than what are currently observed. The trees existed in aggregated even-aged groups of trees with a balance of age classes exhibited on a multi acre scale.

The forest conditions that currently exist in much of the Front Range are the continuous, unhealthy high-density stands. In the areas burned by the Black Forest Fire, the community has an opportunity to replant the forest with a focus on returning our forests to a healthy, fire resistant, and sustainable ponderosa pine ecosystem with significantly fewer trees per acre. Replanting may be planted in a place where they are most appropriately done by focusing on planting in even-aged groups of 2-12 trees with spacing between trees being 2-30 feet apart, and distances between groups of 80 to 150 feet apart. Don't plant all at once! Maintaining age class diversity is a key component to what makes a ponderosa pine forest normally function, by planting groups randomly with age being highly interspersed amongst one another. Seedlings ought to be easily watered and maintained, as the burned area is a very inhospitable place for seedling survival. Using draws, existing downed logs, etc to serve as hospitable micro climates that can provide a higher probability for seedling survival.

Additionally, in an attempt to not re-create the problem, you should plant native trees in a spatial arrangement that can effectively break-up the fuels for potential future fires and insect out breaks, but also provide for visual and audio screening for privacy. Always keep in mind that the seedlings you plant today will be the future forest in 50 to 100 years. We do not want to plant a new sea of green that is susceptible to another large fire and insect outbreak.

Where can I purchase seedling trees?

The Colorado State Forest Service administers their seedling tree program on an annual basis. The objective of the program is to provide low cost seedlings to landowners who have two or more acres, and for which the trees are intended to be used for conservation purposes. The

Colorado State Forest Service at their CSU Foothills Campus grows the seedlings. Call the Woodland Park District Office for seedling sales and dates, 719.687.2921

The following species are generally offered:
--- 10" to 30" bare root deciduous shrubs and trees canes, including species such as chokecherry, native plum, and wild roses, or 5" to 12" top height bare root conifers including ponderosa pine. The bare root seedlings sell for $44 for 50 seedlings.
--- Potted trees of 5" to 12" top height in 2" x 2" square pots. Includes species of Rocky Mountain juniper, Douglas fir, and ponderosa pine. Sell for $56 for 30 seedlings.
--- Smaller potted seedlings (are 3" to 6" in top height) in a 1" round tube. These seedlings sell for $36 per 30.
A seedling description and picture of each species is available at: **http://csfs.colostate.edu** (search for "seedling purchase" in the top right search box).

Are my partially-burned trees at risk from attack by bark beetles?

Yes, trees that survived the fire are now highly susceptible to bark beetle attack. After a fire, there is a tremendous amount of chemicals (phenols and turpines) released into the air by the weakened trees. Bark beetles can "smell" the chemicals that these weakened trees are producing and they may attack trees within the fire perimeter.

How do I put a value on trees I've lost?

First, you need to check your homeowner's policy to see if it includes a monetary cap on tree damage per tree or per property. The Internal Revenue Service (IRS) also has a cap on the amount you can deduct for losses. Please refer to the IRS website **www.irs.gov** or your tax preparer for this information.
Most insurance companies only cover the loss of trees and specialty items (i.e. sculptures) in a landscape, not grasses and shrubs. There are three different methods used to evaluate the value of trees in a landscape. You can hire a professional tree appraiser (there is a certification program to appraise trees, (**http://secure.isa-arbor.com**) to give you an estimate. Also, the following websites describe and provide the formulas for estimating your tree loss.
www.ianrpubs.unl.edu/epublic/pages/publicationD.jsp?publicationId=91

http://extension.usu.edu/htm/publications/publication=6287

www.ksre.ksu.edu/library/hort2/mf632.pdf

Erosion Control

The importance of erosion control cannot be overemphasized. The destructive nature of a wildfire such as the Black Forest Fire stresses soils to the point where they can no longer contain or minimize runoff from rain and drainage water in the same way they did before the fire. If care is not taken to adequately stabilize and rehabilitate damaged soils, the risk of debris flows and flooding can endanger people and property within and around the burn area.

For the purpose of this guide, we will primarily address the strategies that individual property owners can take to rehabilitate the soils on their own lands.

What treatments are recommended to help reduce erosion and runoff?

Mulching is one of best treatment options available to help limit the amount of soil erosion and runoff after a fire. If your land is on relatively steep slopes (about 20-60% slope) and was moderately-to-severely burned by the fire (with a high amount of ground cover consumed), then it would probably be beneficial to apply mulch to your land. Determining if your land needs to be mulched can be tricky and often depends on your individual site. Members of the Rehabilitation Outreach team are available to help you determine if it would be beneficial to apply mulch on your land.

What type of mulch should I use and what is the best way to apply it?

The two mulch types that are commonly available in our area are certified weed-free straw mulch and wood chips. Each type has its advantages and disadvantages. Certified weed-free straw mulch is the easiest type of mulch to apply by hand and is very effective at reducing runoff. Its biggest downside is that it is light and can blow around in high winds. Straw mulch should be applied to a depth of one or two inches and ideally cover 70-80% of the ground. Wood chip mulch can be created on-site by chipping burned dead trees. Chipping is often the best use of burned trees and has proven to be very effective in reducing erosion after a fire. After chipping is done with a machine chipper, you will generally need to hand rake the chips to an even depth. It is critical that chips are spread evenly to a depth of no more than one inch and ideally cover 70-80% of the ground. If chips accumulate in deep piles, they will inhibit native plant re-growth, exacerbating erosion concerns. Wood chip mulch use can be self-limiting because many areas are inaccessible to chippers. Areas that chippers cannot access are good areas to apply straw mulch.

Another type of mulch that is effective at reducing erosion is a product called WoodStraw™ mulch. It is more expensive than other types of mulch and isn't available locally at retail outlets. However, it has less potential to introduce weeds and stays on the hillside better in wind. Visit the company's website, **www.woodstrawmulch.com** to find out more information.

When should mulch be applied?

Mulching should be before the rainy season starts or as soon as possible. If possible, it is beneficial to apply straw mulch and WoodStraw™ in the early spring right before a spring snowstorm. This helps bond the straw to the ground. Wood chip mulch and WoodStraw™ can be applied at any time.

Where do I get certified weed free straw?

The Colorado Department of Agriculture publishes a certified weed free forage directory (it contains both hay and straw) available at **www.colorado.gov/cs**. The directory does not separate hay and straw producers so look for straw producers. Bales come in different sizes. For hand mulching, smaller bales are recommended. Larger bales require lifting equipment to move them. Local farmers might be able to deliver directly to your property if several people purchase a whole load together. Consider delivery to a central, easily accessed (both by you and the delivery equipment) location.

Why does mulch help reduce erosion?

Mulching is effective at reducing erosion after a fire because of its ability to reduce the impact of raindrops before they hit bare soil. Each time a raindrop impacts bare soil, it creates a micro-explosion of sorts that dislodges soil particles allowing them to move downhill. Mulch slows the incoming raindrops' velocity and also helps to slow the rain runoff as precipitation gains velocity and runs down slope. The first year after a fire, when native vegetation has not reestablished, is the most likely time that major erosion will occur. Erosion will continue to be a concern in subsequent years, but will likely be the worst the first and second rainy season after a fire.

Does contour log felling or the use of straw wattles help reduce runoff?

Contour log felling and straw wattles have been a common post-fire erosion control technique for many years. Recent evaluation of their effectiveness, however, has lead natural resource experts to begin moving away from their large-scale usage in fire rehabilitation. Our team does not believe the use of these erosion barriers is the most cost-effective way to control erosion on your land, unless it is used for point protection, such as above a structure or other value at risk. Instead we would recommend mulching your hill slopes with certified weed-free straw mulch or wood chip mulch.

Contour log felling is very labor intensive to install and easy to do incorrectly. Research suggests that even when logs are installed perfectly, they only provide erosion control for the first couple rain events. Logs quickly fill with sediment during large rain events, after which, sediment simply flows over the top of the contour felled logs.

Contour log felling can be a good option if you are simply trying to utilize burned dead trees on site and should be combined with mulching. Putting logs on the hill slope contour aids in log decomposition. If you decide to use contour logs to help reduce erosion, please consult with us before installation to ensure you are installing the logs in a manner that will provide the greatest benefit..

Straw wattles (shown below) are easier to install than contour logs but recent research sees similar results as contour log felling. Straw wattles provide erosion control for the first couple rain events, but also quickly fill with sediment. A major advantage of straw wattles over contour logs is that they are easier to correctly place on the hillside and have fewer gaps where water can flow under the wattle.

Could runoff from burned hill slopes impact my private road or driveway?

Yes, in many locations throughout the burned area, private unpaved roads and driveways may be impacted by erosion or deposition of sediment or debris. Damage to the road surface, roadside ditches and/or cross drainage features may occur. Initial research in the burn area has identified increased potential for loss of access and threats to safety of road users.

How can I control erosion on my private road or driveway?

All of these methods are recommended as ways to improve drainage and erosion control on roads and driveways:

Improve Drainage on Unpaved Roads and Driveways

Improving and/or maintaining drainage on unpaved roads and driveways may lower the risk of erosion of the road surface and/or loss of access. Drainage practices that may be effective include: out-sloping, de-berming, installation or increasing frequency of rolling dips and water-bars, and culvert removal/upsizing/modification.

Storm Inspection and Response on Roads and Driveways

Keep culvert and drainage structures functional by cleaning sediment and debris from the inlet before storm events. Following a storm event, identify impacted roads culverts and respond by initiating a cleanup effort to remove accumulated sediment and debris from roadways, or repair/maintain damaged roads or road drainage features.

Channel Debris Clearing

Channel-debris clearing removes debris from the channel and flood-prone areas that could dislodge and plug culverts downstream. High priority areas for treatment would include areas in close proximity to houses and directly upstream from culverts. Debris may include burned wood from trees and debris from burned structures. Generally, this treatment would be done manually with a focus on small debris considered likely to be transported downstream.

Does reseeding help with erosion control?

Experience shows that seeding has become less popular as an erosion control treatment due to its limited effectiveness at providing an effective ground cover in the first year after a wildfire. In a review of existing post-fire seeding studies, few studies demonstrate statistically significant decreases in sediment movement, especially in the very coarse soils of a fire area. Ground cover establishment in the sandstone and shale soils found would benefit long term soil erosion mitigation efforts. However, successful establishment from seed can be compromised with the appropriate amount of mulch to stave-off erosion. Mulching should trump seeding if a decision is made for one or the other. The major concern is that seedlings are just too small the first year to effectively hold soil in place and simply get washed off the hill slope during large rain events. Seeding has proven to help with erosion in the second and subsequent years after a fire, however by this time native vegetation has often reestablished on its own.

NRCS Fact Sheet

http://www.co.nrcs.usda.gov/news/pas/2012_Fires/2012%20Seeding%20Fact%20Sheet.pdf

Do I need to reseed? When do I need to reseed?

In most cases, no, you won't need to reseed. Even in the most severely burned areas, research suggests that post-fire native grasses and flowers will reestablish on their own. Lessons learned from past Front Range fires show that native vegetation is very well adapted to fire and will begin re-growth in the spring. The only areas that we believe seeding could be beneficial are areas at risk for noxious weed infestation. Based on experience from recent nearby area fires, noxious weeds are expected to establish and expand in the burned area. Weed infestations are highly probable, particularly along roads and driveways and riparian areas, and in high to moderate burn intensity areas. Seeding may be beneficial in known noxious weed infestation areas and within 100 ft. of roads and driveways in the most severely burned area.

When is the best time to reseed? What type of seed should I use and where do I get the seed?

Reseeding can be done from approximately mid-October to mid-April. The soil must be thawed enough to incorporate the seed into the soil with no snow on the ground. The problem with seeding in late fall and winter is the potential for high winds to blow the seed away. Springtime

prior to spring snows and rain is a very good time to seed. Mulching after seeding can protect the seed from the wind and also maintain soil moisture for germination. Due to the timing of the fire, the reseeding effort for weed control will take place between March and April.
Please contact your local NRCS office for a site visit to help you determine if seeding is a good option.for your particular site.

What techniques will give my seeding the best chance for success?

One of the keys to successful reseeding is good seed. It is important to obtain your seed from a reputable seed company. They can provide you with the test information for the lots used to make the mix, which is important to know that you are buying quality seed. Always purchase seed on a pure live seed (PLS) basis. Pure live seed tells you how many seeds per pound of seed are viable and will germinate. No seed lot is without a few weed seeds in it, but you should strive for the best seed mix possible. Also, not all problematic weeds, like cheatgrass, are considered noxious weeds, but you want to make sure to avoid them. Always look for the seed analysis to know what makes up the lack of purity in sampled seed, and sometimes simply ask if there is cheatgrass or other noxious weeds in the seed, and never purchase any seed with noxious weeds in it.
Timing is crucial, attempting to seed immediately after a fire during drought conditions may present poor timing, but it may also be good if light summer rains can provide conditions for germination and establishment. Fall seeding can provide the best success for successful recruitment because of temperature and moisture scarification (i.e. preparing the seed to germinate when spring comes around) and because the seasonal moisture can help facilitate good contact between the seed and mineral soil.
The next key for success is good seed to soil contact. You will want to broadcast (by hand or with a spreader) about 80 seeds in a square foot (you can count out 80 seeds and spread it over a measured square foot area to calibrate your eye). Once the seed has been spread, lightly rake the seed into the soil parallel with the land contour. Raking perpendicular to the contour (down the slope) will only add to erosion problems. The seed needs to be between ¼ to ½" in depth. Raking the seed in deeper than ½" will prevent the seed from germinating and emerging. You will still be able to see some seed at the soil surface and this is not a problem. Mulching after seeding is recommended to hold the soil and seed in place and retain soil moisture for germination. Mulch should be 1" in depth.

I still have questions about erosion control. Who do I call?

The Natural Resources Conservation Service is available to answer all of your erosion control questions.
Call the Colorado Springs Field Office at 719.473.7104 Ext 3.

Noxious Weed Control

What do I need to do with the weeds?

Weeds will sprout in the spring and summer. If you had known infestations of noxious weeds prior to the fire, they will still be there next year. The fire in most cases did not burn hot enough to destroy the root systems or weed seeds. The weeds will take advantage of the situation and potentially spread farther or increase due to the lack of native vegetation. You can bring in plant samples to the CSU Extension office for identification and control recommendations.

If you would like to speak more about noxious weed management contact the CSU Extension Office.

Contacts

El Paso County Conservation District
(office) 719.473.7104 Ext. 3

Kiowa Conservation District
(office) 303-688-3042 Ext 100

Colorado State Forest Service, Woodland Park District
(office) 719.687.2921
(email) CSFS_WoodlandPark@mail.colostate.edu

Natural Resources Conservation Service, Colorado Springs Field Office
(office) 719.473.7104 Ext 3
(email) greg.langer@co.usda.gov

City of Colorado Springs, Forestry Division
(office) 719.385.5942
(email) psmith@springsgov.com

El Paso County Forestry and Noxious Weeds
(office) 719.520.7879
(email) kathyandrew@elpasoco.com

Colorado State University Extension, Colorado Springs
(office) 719-520-7675
(email) el_paso@ext.colostate.edu